

a plurality of data areas, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

E1 bookmark information areas respectively provided at predetermined locations in said plurality of data areas, each having a pair of bookmark information indicative of a time at which said data is loaded in a time series data piece in each of said data areas and state transition information indicative of a state of the data piece in said each data area, said state transition information being allowed to have one of a value indicative of an online state in which the data area is permitted to be retrieved and a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved.

4. (Four Times Amended) A data structure, stored on a storage medium, in a database, comprising:

E2 a plurality of data areas in which given time series data pieces are loaded at predetermined locations, respectively, in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

predetermined bookmark information areas each having a pair of bookmark information indicative of a time at which said data is loaded in a time series data piece in each of said data areas and state transition information indicative of a state of the data piece in each data area, said state transition information having one of a value indicative of an online state in which the data area

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is permitted to be retrieved and a value indicative of a loading state in which loading of data in each data area has not yet been completed and the data area is not permitted to be retrieved.

7. (Four Times Amended) A database managing method for managing data in a database, comprising:

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adding, to a predetermined location in a given time series data piece for a predetermined time, bookmark information having bookmark information indicative of a time at which said data is loaded in a [corresponding to said] time series data piece for said predetermined time and state transition information indicative of a state of said time series data piece for said predetermined time;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty; and

loading time series data pieces for predetermined times in a plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series.

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12. (Four Times Amended) A database managing method for managing data in a database, comprising:

E4 adding, to a predetermined location in a given time series data piece for a predetermined time, bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for said predetermined time and state transition information indicative of a state of said time series data piece for said predetermined time and start area information having a flag indicating whether the area is the final one of a plurality of areas in said database and an address area for setting an address;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved and a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved;

loading time series data pieces for predetermined times in a plurality of consecutive data areas in said database, each of said plurality of consecutive data areas being loaded with data generated in time series during a certain time, the plurality of consecutive data areas being managed by the time series; and

raising said flag of start area information in the final one of said plurality of consecutive data areas and setting an address of first one of said plurality of consecutive data areas in said address area.

E5 14. (Four Times Amended) A database managing method for managing data in a database, comprising:

reading bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for a predetermined time and state transition information indicative of a state of said time series data piece for

said predetermined time from a predetermined bookmark area and setting the state of said time series data piece in said state transition information to a value indicative of a state in which data is empty so as to write said bookmark information in said database; and

E5 loading given time series data pieces for given predetermined times in a plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

writing bookmark information having bookmark information indicative of a time corresponding to a time series data piece for said predetermined time and state transition information indicative of an online state of said time series data piece for said predetermined time in said predetermined bookmark area.

19. (Four Times Amended) A database managing method according to claim 14, further comprising:

E6 cumulating repeatedly applied time series data pieces in a cumulative storage area until the cumulative data reach total data for said predetermined time; and

adding, to a data piece in said cumulative data storage area, bookmark information having bookmark information indicative of a time at which said data is loaded in said data piece for said predetermined time and state transition information indicate of a state of said time series data piece for said predetermined time and loading resulting data pieces in said plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in

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time series during a certain time, the plurality of data areas being managed by the time series.

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20. (Three Times Amended) A database managing system, comprising:
a processor having a memory for storing data for a certain time and a clock for reading times at which said data are applied, the memory being managed by time series; and

a database connected to said processor and having bookmark information indicative of a time at which said data is loaded in a time series data piece for a predetermined time, state transition information indicative of a state of said time series data piece of said predetermined time and said time series data pieces for said predetermined times, said state transition information having one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty.

Please add the following new claims:

E8
--21. A data base managing method for managing data in a database comprising the steps of:
pointing to a segment of a database which stores a data most oldest in time series based on a retrieval request requesting data of time series between a first time and a second time;

acquiring time information from a bookmark residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in said database;

seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

reading data from said segments found in the seeking step.

22. A database managing system comprising:

means for pointing a segment of a database which stores a data most oldest in time series based on a retrieval request requesting data of time series between a first time and a second time;

means for acquiring time information from a bookmark residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in said database;

means for seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

means for reading data from said segments found in the seeking means.--